

disturbed by the statement of the principle that the provision made for scientific and technical study and research should be as great as that given by any two other nations, the comparison will serve a useful purpose in directing attention to a view of the claims of science worthy of consideration.

It is a very great honour for a student of science to be called upon in such an august assembly as this to say a few words; but if I am to be accepted as the representative of science I do not wish to be fettered by your suggestion, Sir, that I should refer to the dependence of art on science. I am sure that I may frankly say for every man of science that we acknowledge freely the firm brotherhood between art and science—a brotherhood founded upon a common object, the study of Nature, “the mistress of all the masters,” and carried on by a common method, the proper co-ordination of brain, hand and eye. In every case with which a man of science or a man of art has to deal, imagination is required, and so science and art meet upon terms of mutual helpfulness. I think I may also say that this feeling is thoroughly reciprocated by men of art, for many of them honour me with their friendship, and therefore I know their sentiments. I am the more anxious to say this because some twenty years ago, when I was privileged to attend this anniversary dinner, I heard a distinguished representative of literature express a totally different sentiment. He told us that “before their sister, Science, now so full of promise and pride, was born, there were Art and Literature like twins together,” and it was suggested that the sooner art and literature formed an alliance offensive and defensive against the interloper, the better it would be for them. I do not believe in this. For me science is as old as art. They have both advanced together. Let us take the position of things 6000 years ago, to begin at the beginning of things, if we can. Then the priest-mummifiers of Memphis had to be profound anatomists. If you go to the Gizeh Museum you find magnificent specimens in those statues of Chepren in diorite, other statues in wood, and the plaques, veritable Memlings in stone, which clearly show that this knowledge was also possessed by their sculptors. If you come down to a comparatively modern period, something like 600 B.C., and compare those wonderful metopes of Solinunto with the marbles of the Parthenon, which are of a later date, you will find an enormous advance in the latter. You will find that Hippocrates had lived in the interval, and, indeed, that he and Phidias were contemporaries and fellow-townsmen. Carrying the matter down to the introduction of Universities into Northern Italy in the thirteenth century, we find that the difference between the art of Cimabue and Giotto depends on the fact that anatomy had been introduced in the meantime. Science, then, is no new interloper, seeking to detract from the importance of art and literature. What was new twenty years ago was that the work of the late Prince Consort, whose name will always be revered by those who know the benefits he conferred on our country, was then beginning to tell. He showed us that in order to secure industrial progress we must have, above all things, instruction and practice in science and art. In war, being well assured of the valour and endurance of our sailors and soldiers, the chief thing we have to do is to see that they are properly supplied with the engines and munitions of war, and, more than these, the scientific spirit. In peace, for the beauty of a nation's life and a perfect record of it, we must look chiefly to the sweetening and ennobling influences of art and the enduring works of its masters; but for a nation's continued welfare and progress both science and art are necessary. We are in face of industrial struggles, and we must utilise both science and art to supply the wants of our own and other countries, and to provide commodities made in England, besides handling

“ Things of beauty, things of use,  
That one fair planet can produce,  
Brought from under every star.”

We are in face of a struggle for existence in which we know full well that only the fittest will survive. How are we going to carry on the struggle? What are our weapons? Our first line of defence in this direction can only consist of our Universities and our teaching centres. Have we enough of them? We know already that we have not enough of them, because we have already lost several important engagements in these industrial battles. Are there no means by which we can judge of their sufficiency? In relation to non-peaceful international struggles in which also defeat has to be guarded against, a clear and

universally approved policy has been enunciated; this is, that the future of our empire, an empire the real unity and strength of which are developing under our eyes at this moment, can be secured if we see to it that our first line of defence, our fleet, shall be equal in strength to the fleets of two other possibly contending powers. The second answer then, I think, is that this principle should be applied to our first line of defence in those industrial conflicts the results of which are much more enduring. Do our teaching and research centres at present outnumber in the same proportion, as do our ships, those of any two nations which are actually contending with us in peaceful enterprise? And, also, are they equally efficient in every respect? I believe, and I know that this view is held by many representative men of science, that until our Universities, our science schools, our art schools, and our technical institutions bear the same relation both in number and efficiency to those of other nations as do our battleships, cruisers, and small craft, we shall not be justified in regarding the future of the empire with that freedom from care which is the attribute of a strong man armed.

#### NOTES.

PROF. E. SUESS, professor of geology in the University of Vienna, has been elected a Foreign Associate of the Paris Academy of Sciences, in succession to the late Sir Edward Frankland. Sir John Burdon-Sanderson, Bart., has been elected a Correspondant of the Academy, in succession to the late Sir James Paget.

DR. S. L. TÖRNQUIST, of Lund (Sweden), has been elected a Foreign Member of the Geological Society, and Prof. F. Sacco, of Turin, has been elected a Foreign Correspondent.

WE much regret to see the announcement of the death of Lieut.-General Pitt-Rivers, F.R.S., the distinguished anthropologist, on Friday last.

THE annual conversazione of the Society of Arts will be held at the Natural History Museum, South Kensington, on Wednesday evening, June 20.

THE adjourned debate on the Sea Fisheries Bill was resumed in the House of Commons on Monday. After a long discussion, a division was taken, and a majority was obtained in favour of the second reading. The Bill was then referred to a Select Committee.

It is reported that Vesuvius has shown signs of increased activity during the past few days. Explosions have taken place in the crater of the volcano, and masses of rock and lava have been ejected. The huts of the guides and the topmost station of the funicular railway are threatened. Reuter reported that four Englishmen who ascended Vesuvius on Tuesday went beyond the limit indicated as dangerous by the guides and gendarmes, and were seriously injured by a mass of ejected material striking them. This however has since been denied by Reuter's Naples Correspondent.

THE U.S. National Academy of Sciences has decided to award the Barnard medal to Prof. Röntgen for his discovery of the X-rays. This medal is awarded at the close of every quinquennial period for a discovery in physical or astronomical science, or novel application of science to purposes beneficial to the human race. The first presentation of the medal was to Lord Rayleigh and Prof. Ramsay for their joint discovery of argon.

REUTER'S AGENCY learns that Dr. Louis Sambon and Dr. G. C. Low, who has been awarded the Craggs research scholarship of 300*l.* per annum, are about to experiment with a view to proving that malaria is spread by mosquito bites, and expect to begin work seriously on June 1, by which time they will have all their arrangements completed. A suitable spot has been chosen

for the erection of their mosquito-proof house in the Campagna, on the line of the railway running from Rome to Tivoli.

A MEETING of the International Association for the Advancement of Science, Arts and Education will be held at the Society of Arts to-morrow (May 11), at 4 p.m. Sir Archibald Geikie, F.R.S., vice-president of the British Committee, will preside. The secretary, Prof. Patrick Geddes, will deliver an address on the nature and aims of the Association and its forthcoming assembly at the Paris Exhibition.

IN connection with the International Congress of Physics to be held in Paris from August 6 to 12, a preliminary programme of papers has been issued. Over sixty reports have already been promised, and among the names of contributors we notice those of Amagat, Arrhenius, d'Arsonval, Battelli, Becquerel, Blondlot, Bouty, Boys, Branly, Brillouin, Broca, Cornu, Curie, Exner, Griffiths, Hurmuzescu, Lippmann, Lorenz, Poincaré, Potier, Poynting, Pringsheim, Righi, Spring, J. J. Thomson, Villard, Warburg and Wien.

THE next meeting of the Comité International des Poids et Mesures is fixed for September 10, 1900. Owing to the death of M. Joseph Bertrand, and the resignation of Prof. Thalen, two of the original members of the Comité, the number of members is now limited to eleven. Great Britain will be represented at the forthcoming meeting by Mr. H. J. Chaney, a member of the Comité.

THE death of M. Edouard Grimaux, at the age of sixty-five, occurred during the past week. M. Grimaux succeeded Cahours as professor in the Ecole Polytechnique at Paris, and also held a chair at the Agronomic Institute. He made numerous and valuable contributions to organic chemistry, and was the author of several chemical treatises. He will be gratefully remembered by chemists for an admirable biography of Lavoisier, which he published in 1884. M. Grimaux lately became prominent in connection with the Dreyfus case. At the Zola trial he expressed his belief in the innocence of Dreyfus. For this he was deprived of his professorship by General Billot, notwithstanding the fact that he had rendered devoted service to the army in 1870. In 1894 M. Grimaux was elected to the Academy in the place of Frémy.

REPLYING to a question in the House of Commons on Monday, Mr. Akers-Douglas stated that the new National Physical Laboratory is not to be erected, as has been reported, in the Queen's Cottage grounds, or in any other grounds attached to Kew Gardens. It will stand quite outside those Gardens on Crown land. The only part of the scheme which might possibly be supposed to affect the amenities of the Gardens is a small building which will not, at the outside, cover a quarter of an acre. This building will be so placed as not to interfere with the views from the Gardens over the Old Deer Park, and it will not be opposite to that part of the Gardens round the Queen's Cottage which is reserved in a wild state. The building will only be used for delicate scientific work which will not disturb the seclusion of the neighbourhood of the Queen's Cottage, and which, in fact, itself requires as much quiet and privacy as can be obtained.

THE Paris correspondent of the *Chemist and Druggist* states that science is represented at the Salon by several portraits of average merit. The best is that of Dr. Vaillard, head army surgeon and professor at the Val de Grace Military Hospital, where he is known to two or three generations of army pharmacists who have followed his lectures. Dr. Vaillard is of middle age, and is shown standing, in regimental dress, with the Cross of the Legion of Honour on his tunic. His left hand is leaning on a laboratory-bench, on which are a microscope and a variety

of analytical appliances. To his right is a lecture-blackboard, and one can dimly see his written demonstration. The artist is M. Paul Bourdier. The portrait of M. Hautefeuille, chemist, and member of the French Institute, is the work of a lady artist. She shows him in everyday attire in a corner of his laboratory, sitting at a table, with a collection of scientific apparatus near at hand; in the background is a furnace, at which an assistant in a white blouse is working. M. Tisserand, of the French Institute, is another portrait of fair merit. One would like to see more of this class of picture, but must suppose artists find no market for them.

THE death of Dr. Edmund Atkinson on the 4th inst., after a very short illness, will be a matter of deep regret to his large circle of friends. He was born at Lancaster in 1831, and was a student of Owens College, Manchester, in the early days of that institution. There he became assistant to the late Sir Edward Frankland, the first professor of chemistry in the College, and was associated with him in organising the laboratory which has since become so well known. About 1854 he went abroad for some years and continued his scientific studies at the Universities of Marburg, Göttingen and Heidelberg, and at the Ecole de Médecine in Paris under Wurtz. On his return to England he became private assistant to Sir Benjamin Brodie at Oxford, then science master at Cheltenham College, and afterwards professor of experimental science at the Royal Military College, Sandhurst, and at the Staff College. He was several times elected upon the council of the Chemical Society, and was one of the founders of the Physical Society, of which Society he was treasurer from the beginning until the last anniversary meeting, with the exception of a short interval a few years ago. Dr. Atkinson rendered great service to science by his numerous translations into English of foreign scientific works; among these the best known are Ganot's "Elements of Physics," von Helmholtz's "Popular Scientific Lectures" and Mascart's "Treatise on Electricity and Magnetism." He was a man of excellent judgment in practical affairs, and of late years he gave much time as a magistrate to the local affairs of his neighbourhood. He was always ready to undertake onerous duties for those in need of help, and was a most generous and steadfast friend.

THE council of the Royal Geographical Society have awarded the two Royal medals for this year to Captain H. H. P. Deasy and Mr. James McCarthy. The Founders' medal has been awarded to Captain Deasy for the exploring and survey work accomplished by him in Central Asia. Mr. McCarthy is the Government surveyor of Siam, and the Patron's medal has been awarded to him for his great services to geographical science in exploring all parts of the kingdom of Siam, for his laborious work during twelve years in collecting materials for a map, to form the basis of a survey system, and for his admirable map of Siam just completed. The other awards have been made as follows:—The Murchison award to M. Henryk Arctowski for the valuable oceanographical and meteorological work which he performed on the Belgian Antarctic expedition; the Gill memorial to Mr. Vaughan Cornish for his researches, extending over several years, on sea-beaches, sand-dunes, and on wave-forms in water; the Back grant to Mr. Robert Codrington for his journeys in the region between Lakes Nyassa and Tanganyika, during which he removed, on behalf of the Society, the section containing the inscription from the tree under which Livingstone's heart was buried; and the Cuthbert Peek grant to Mr. T. J. Alldridge for his journeys during the past ten years in the interior of Sierra Leone, during which he has done valuable geographical work.

THE following opportunities for the study of botany during the ensuing summer season in the United States are mentioned

in the *Journal* of the New York Botanic Garden for April:—Columbia University, New York, has instituted a summer session, beginning July 2 and ending August 10. The department of botany will be under the charge of Prof. Lloyd, who will offer courses in ecology, general botany, and research work in select subjects. Students in these courses will have access to the museum and collections of the Botanic Garden. The Woods Holl Laboratories will be open from July 5 to August 16, and the botanical staff includes Dr. B. M. Davis, Mr. G. T. Moore, Dr. R. H. True, Miss Rhoda A. Esten, and Miss Lillian G. MacRae. Courses in cryptogamic botany, plant physiology, and plant cytology will be offered. The biological laboratory at Cold Spring Harbour will be open from July 2 to August 25, the botanical staff including Dr. D. S. Johnson, Dr. H. C. Cowles, and Mr. W. C. Coker. Courses of lectures will be offered in cryptogamic botany, ecology, and bacteriology.

THE Annual Summary of the *U.S. Monthly Weather Review* for 1899 contains a very interesting account of the climate of St. Christopher, by Mr. W. B. Alexander. The island lies in latitude 17° 20' N. and longitude 65° 45' W.; its length is 23 miles, and the breadth of the main body is about 5 miles. The central part is occupied by a range of mountains, the highest of which, Mount Misery, rises to a height of about 4100 feet. Tables and diagrams are given showing the barometric pressure for 35 years, and the rainfall for 44 years at Basseterre, which is situated in a spacious and fertile valley. The climate, generally speaking, is dry and healthy, being tempered and purified by frequent thunderstorms. The mornings and evenings of the hottest days, which occur in August, are agreeably cool; the coldest months are January and February. The mean annual temperature is about 81°, of August, 83°, and February, 78°. The mean annual rainfall is about 51.6 inches; 37 per cent. of the amount occurs during the first half of the year, and 63 per cent. during the last half. The rainfall is more frequent than heavy; it has only reached or exceeded 5 inches in 24 hours eleven times in 44 years.

IN the *Proceedings* of the South African Philosophical Society, vol. xi., Mr. J. R. Sutton publishes an important discussion of the winds of Kimberley. The results are obtained from three years' hourly observations with Osler and Robinson anemometers. The period is admittedly short; but the excellence of the position and the scarcity of hourly observations in South Africa are quoted as reasons for not delaying the appearance of the paper. The observatory is situated at Kenilworth, about three miles N.N.E. of Kimberley, at an altitude of nearly 4000 feet. It has been supposed that there was an overwhelming excess of northerly winds, and theories have been propounded why this is the case; but the conclusion to be drawn from the paper is that while sometimes one and sometimes another direction may preponderate from year to year, a definite prevailing wind does not exist. Of the 25,898 hours of wind analysed throughout the three years, the final resultant contains the small components of only 50 hours to the north and 100 hours to the west. The diurnal curve of wind velocity contains two maxima (2h. p.m. and 10h. 45m. p.m.) and two minima (5h. a.m. and 7h. 30m. p.m.). The mean hourly velocity is 6.6 miles per hour.

AN interesting illustration of Doppler's principle is noted by Prof. F. Richarz, of Greifswald. The writer was standing by the Brenner Pass near a curve where a railway train was approaching him, the line being backed by a wall of mountain. On the engine giving a short whistle, an echo was heard, the pitch of which was at least half a tone lower than the original sound.

THE American Museum of Natural History, New York, as we learn from a note recently published by Mr. J. A. Allen, has recently obtained a specimen of the head of the wood-bison

(*Bison americanus athabasca*), which is still in existence in the forests near Great Slave Lake. Compared with the bison of the plains (now extinct in a wild state) the woodland bison is stated to be rather larger than the former, and to have the bases of the horn-cores relatively thicker. In 1894 the herd of wood-bisons in the Great Slave Lake district was estimated to be some hundreds in number, but in 1899 it was reduced to about fifty. A very few years more will probably witness the complete extinction of this animal.

AT a recent meeting of the Geographical Society of France, the well-known naturalist, M. Grandidier, the author of the great work upon the natural history of Madagascar, gave an account of his last expedition to that Island, in 1898-99. M. Grandidier landed at Tuléar, on the south-western coast of the Island, and thence made an adventurous journey through the interior to Fianarantsoa, in the Betsileo country, in the south-eastern district. M. Grandidier on his way visited the well-known deposits of Ambolisatra, about 35 kilometres north of Tuléar, where numberless fragments of *Aepyornis*, and almost entire skeletons of the small Madagascar hippopotamus, besides remains of many lemurs of gigantic size and other extinct animals were obtained. From Fianarantsoa, M. Grandidier proceeded north through a well-known country to Antananarivo, the capital of the Island.

AS in the case of other larger mammals, the process of dividing the giraffe (*Giraffa camelopardalis*) into "sub-species" is now proceeding apace. Mr. de Winton (*P.Z.S.* 1897, p. 273) first showed, on good grounds, that the giraffe of South Africa was, in certain points of structure, different from the giraffe of the Sahara and Nubia, and proposed to call the former *Giraffa capensis*, leaving the old name *Giraffa camelopardalis* for the northern form. Since then, Mr. O. Thomas (*P.Z.S.* 1898, p. 40) has separated the giraffe of Upper Nigeria from the northern form under the title *Giraffa camelopardalis peralta*. Still more recently, Herr Matschie, of Berlin (*Sitzb. ges. Nat. Fr.* Berlin, 1898, p. 75), has added two new names to the list of giraffes, and called them after their discoverers, *G. tippelskirchi* and *G. schillingsi*, the former being from German East Africa, and the latter from British East Africa. It is curious that these two closely adjoining districts should not agree even in having the same form of giraffe!

THE *Quart. Journ. Micr. Science* for April contains an account by Monsieur P. Bouvier of the results of his examination of the specimens of the primitive Arthropods, commonly known as *Peripatus*, in the collection of the British Museum. The author, who adopts the generic divisions proposed by Mr. Pocock, names one new Andean form after the Director of the Museum, and shows that, with the exception of one from the Congo and a second from Sumatra, all the representatives of the typical genus *Peripatus* are American. To the same journal Mr. E. Warren communicates a paper on the individual differences exhibited by one of the water-fleas (*Daphnia magna*) in its power of withstanding the introduction of salt into the water in which it lives. The physiological condition of the individual is found to have a great effect on its salt-resisting powers.

IN the last issue of the *Zeitschr. Wiss. Zool.*, Dr. R. Gast relates the life-history of a rotifer of the genus *Apsilus*, specimens of which were recently found in an aquarium at Leipzig. This paper is followed by one on the development of a sponge of the group Sycones by Dr. O. Maas, which is worthy of special notice on account of the beauty of the illustrations.

MENTION has already been made in these columns of the description in the *Notes* from the Leyden Museum of the crustaceans collected during the Dutch Expedition to Central Borneo. In the March issue of the same serial this is followed by an account

of the birds, which have been worked out by Dr. Büttikofer. Although expectations were entertained that many new forms would be obtained, out of 269 species collected all were previously known, and only two were new to Borneo.

THE April number of the *Journal of the Quekett Microscopical Club* contains the description, by Mr. J. G. Waller, of a new marine British sponge, obtained some twenty years ago at Torbay, for which the name *Raphiodesma affinis* is suggested. Another addition to the British fauna is a new species of Hymenoptera (*Prosopis palustris*), from Wicken Fen, Cambridgeshire, described by Mr. R. C. L. Perkins, in the *Entomologist's Monthly Magazine* for March. This discovery should strengthen naturalists in their opposition to the proposed draining of the fen in question.

MANY strange objects are worn by savage peoples, and for various reasons, also, as with us, rarity usually enhances value. In the Pelew Islands the rubbed-down first vertebra (atlas) of the dugong is worn as a bracelet by the more important men, for it is not often that the vertebra in question is large enough to be so worn. The "kilit," as it is called, has recently been fully described and figured by Dr. O. Finsch (*Globus*, lxxvii. 1900, p. 153). In the Timor Group a wooden imitation is employed; but in Timorlaut the second vertebra (axis) of the dugong is employed; but, although the dugong is greatly hunted in Torres Straits and in South-eastern New Guinea, no ornaments are made from its bones or tusks.

DR. HERMANN MEYER gives an account of a second journey to explore the head waters of the Xingu, in the *Verhandlungen* of the Berlin Gesellschaft für Erdkunde. The route taken was from Cuyaba, reached by ascending the Parana-Paraguay from Buenos Ayres, over the watershed and down the Ronuro to its junction with the main stream, and back to Cuyaba up the course of the Kulischu; practically the same as the former journey of 1896-97, except that the Ronuro was followed throughout its length instead of the Jatoba, a tributary joining it in its lower course. Dr. Meyer concludes that later expeditions will avoid the Ronuro; the Kulischu gives the best access to the region, an exploration of which as far as the Paranayuba would give valuable scientific results.

THE new number of the *Mittheilungen von Forschungsreisenden und Gelehrten aus den deutschen Schützgebieten* contains some interesting papers from the German East African region. Captain Kannenberg gives the first part of an account of a journey through the Marénga Makāli region, with a map. The pendulum expedition under Dr. Fulleborn and Lieut. Glanning reports progress. A summary of the results of the geological expedition in the region north of Lake Nyassa under Dr. Danz is given, and Lieut. Baumstark contributes a paper on the Warangi.

DR. H. NAGAOKA has contributed a valuable paper on the elastic constants of rocks and the velocity of seismic waves to the *Publications of the Japanese Earthquake Investigation Committee* (No. 4 in Foreign Languages). His experiments were made on about eighty specimens of different rocks, cut into prisms 15 cm. long and nearly 1 cm. square in section. They showed at once that Hooke's law does not hold even for very small flexure and torsion, the deviation being prominent in certain specimens of sandstone, and more marked in torsion than in flexure experiments. On releasing the rocks from stress, the return to the original state is extremely small. The elastic constants of archæan and palæozoic rocks (whether of igneous origin or otherwise) are far higher than those of Cainozoic rocks though the velocity of elastic waves in them is not higher in the same proportion. So far as the experiments go, the elastic constants increase more rapidly than the density, so that the velocity

must be greater in the interior than at the surface of the earth's crust.

WE have received the Twenty-fourth Annual Report of the Geological and Natural History Survey of Minnesota for the years 1895-98; a report which is stated by Mr. N. H. Winchell, the State Geologist, to be his final one. As he remarks: "It ought not to be supposed that by the closing of active work by the present survey, and the publication of its final report, the geology of the State is a finished thing. Geology is a progressive science, and requires continual work." Other States have had surveys which have been hurried to "completion," and have naturally had to enter upon re-surveys, more careful and elaborate. Our own Geological Survey has experienced this as much as any of those abroad; where impatience to see the work "completed" and smallness of revenue have hampered and retarded real progress. The report before us contains a synopsis of the field-work done in Minnesota since 1894, and a useful alphabetical index to the entire series of annual reports of the Survey. Mr. Winchell also notes some of the more important economic and scientific researches which should be carried on in a future survey of the State.

IN the "Palæontologia Indica" for 1899, there is a description of the Cambrian fauna of the Eastern Salt-range, by Dr. K. Redlich, who has supplemented the work of Waagen with more detailed information. A new genus, *Hoeferia*, is now established for the specimens previously referred to *Olenellus*. Among other fossils described are *Hyolithes*, *Lingulella* and *Pseudotheca*. The name *Cylindrites* is applied to "long cylinders, which are often arranged in a fan-shaped aggregate," and appear to be worm-tracks; but it may be pointed out that the name was long ago applied to a genus of Gasteropods. None of the Cambrian fossils from the Salt-range can, in the author's opinion, be referred to a later horizon than the *Paradoxides*-zone. Dr. F. Noetling contributes notes on the morphology of the Pelecypoda, dealing with the hinge of some Miocene and recent bivalves. He endeavours to show that the shape and the delicate and minute variations in the shells can to some degree be expressed better by figures than by words. Dr. C. Diener describes the Anthracolithic fossils of Kashmir and Spiti. In studying the collections made by the Geological Survey of India, he came to the conclusion that fossils both of Permian and Carboniferous ages were included in the series; and he uses the term Anthracolithic as a convenient one for a Permo-Carboniferous group, which appears to be intimately connected stratigraphically and palæontologically. Among the specimens described, the presence of many European types of Carboniferous Brachiopoda is noted, and there are also affinities with the Australian Carboniferous fauna.

IN the form of "Appendix No. 2" for 1900 to the *Kew Bulletin*, we have the usual list of new species of plants brought into cultivation for the first time during last year, or re-introduced after having been lost from cultivation.

THREE of the photographs in natural colours, taken by Mr. H. J. Mackinder in his journey to the summit of Mount Kenya, are reproduced by a three colour process in the May number of the *Geographical Journal*. Colour photography has thus been brought into the service of geographical exploration, and we may expect to see further developments of its use.

THE May number of the *Journal of the Chemical Society*, which now appears with a regularity worthy of emulation by the publications of other scientific societies, contains Sir Henry Roscoe's memorial lecture on Bunsen, accompanied by a photographure of the lamented chemist, and Prof. Thorpe's presidential address on some characteristics of the study and progress of chemistry in Great Britain during the present century.

THE current number of *The Builder* (May 5) contains reproductions of Mr. Aston Webb's drawings of the proposed buildings to be erected in the Imperial Institute Road, South Kensington, to accommodate the physics and chemistry departments of the Royal College of Science. The original drawings are on view at the Royal Academy.

THE "Statesman's Year-book," edited by Dr. J. Scott Keltie, with the assistance of Mr. I. P. A. Renwick (Macmillan), has been accepted as a trustworthy authority upon all matters of political geography for so many years, that people familiar with its pages, and therefore conscious of the extent and accuracy of the information contained in them, regard it as one of the few essential annuals. The volume for 1900, which has just been published, is larger than any previous edition, and the numerous rearrangements of territories which were made last year have necessitated many changes in the text, several of the sections having been almost rewritten. Four specially prepared coloured maps are included, dealing with (1) the partition of North-east Africa; (2) the reorganisation of British Nigeria and the French West African territories; (3) the political partition of the Pacific; (4) the final arrangement of the boundary between British Guiana and Venezuela. The "Year-book" is thus an epitome of recent geographical events as well as a manual of statistical and historical information concerning the states of the world. So long as the volume is kept so completely up to date as it is at present, it is not likely to be superseded.

In a short note in the current number of the *Berichte*, Dr. Marckwald discusses some peculiarities shown by picric acid and its solutions, in the light of the ionic hypothesis. Picric acid, as usually obtained, has an intense yellow colour, but on recrystallising from strong hydrochloric acid it becomes nearly colourless. If this white crystalline mass is sucked nearly dry at the filter pump and washed with a little water to remove the adhering hydrochloric acid, the yellow colour at once returns. The mother liquor, which at first has only a pale yellow colour, also becomes more intensely coloured as water is added. Dr. Marckwald shows that if it be assumed that picric acid is itself colourless, but that the ions,  $C_6H_3(NO_2)_3O$ , are coloured, all these somewhat perplexing phenomena find an immediate explanation in terms of the theory of electrolytic dissociation.

THE confirmation of the relations deducible by thermodynamics as existing between the freezing-point and vapour pressures of a very dilute solution, although of considerable importance for the electrolytic theory of solution, presents great experimental difficulties, especially as regards the vapour pressure determinations. An ingenious method attacking this problem is described in the current *Zeitschrift für physikalische Chemie*, by Dr. R. Gahl. A measured volume of air is drawn through the solution, such as hydrochloric acid, and this is passed through pure water, the change of electrical conductivity of which is measured. The number of cases in which such a method can be applied is obviously restricted, but the accuracy attainable appears to be of the order of .001 mm. of mercury.

THE additions to the Zoological Society's Gardens during the past week include a Grys-bok (*Raphiceros melanotis*) from South Africa, a Yellow-whiskered Lemur (*Lemur xanthomystax*) from Madagascar, presented by Mr. J. E. Matcham; a Violet-necked Lory (*Eos riciniata*) from Molluccas, presented by Mr. H. R. Filliner; two Australian Rails (*Rallus pectoralis*) from New Holland, presented by Mr. C. J. Fox; a Common Boa (*Boa constrictor*) from South America, an Egyptian Eryx (*Eryx jaculus*) from Egypt, presented by Mr. C. W. Lilley; two Eyed Lizards (*Lacerta ocellata*), European, presented respectively by Miss Robinson and Miss Ash; two Edible Frogs (*Rana esculenta*) from Biskra, presented by the Hon. Mrs. A. Cadogan; a

Crowned Lemur (*Lemur coronatus*), a Black Lemur (*Lemur macaco*), two Blackish Sternotheres (*Sternotherus nigricans*), a Radiated Tortoise (*Testudo radiata*) from Madagascar, a Slender Loris (*Loris gracilis*) from Ceylon, two Amherst's Pheasants (*Thaumalea picta*, ♂ ♀), ten Reeve's Terrapins (*Damoniea reevesi*), a Three-banded Terrapin (*Cyclemmys trifasciata*) from China, a Grooved Tortoise (*Testudo calcarata*) from Khartoum, two Roofed Terrapins (*Kachuga tectum*), a Hamilton's Terrapin (*Damoniea hamiltoni*) from India, a Derbian Sternothere (*Sternotherus derbianus*), two Black Sternotheres (*Sternotherus niger*) from West Africa, three Chequered Elaps (*Eiaps lenniscatus*) from South America, a Glass Snake (*Ophirosaurus apus*), European; six Kentucky Blind Fish (*Amblyopsis speleoa*) from Kentucky, deposited; a Brazilian Tapir (*Tapirus americanus*, ♂) from South America, a Cape Hunting Dog (*Lycan pictus*, ♀) from South Africa, two Siamese Pheasants (*Euplocamus proelatus*, ♂ ♀) from Siam, two Rufous-tailed Pheasants (*Euplocamus erythrophthalmus*, ♂ ♀) from Malacca, purchased; a Crowned Lemur (*Lemur coronatus*), an English Wild Cow (*Bos taurus*), born in the Gardens.

#### OUR ASTRONOMICAL COLUMN.

COMET GIACOBINI (1900 a).—This comet has been in an unfavourable position for observation during the past few weeks, but is now rapidly leaving the sun, and may be searched for in the early morning. The following ephemeris is an abridgment from one given by Herr A. Berberich, of Berlin, in the *Astronomische Nachrichten* (Bd. 152, No. 3636):—

##### Ephemeris for 12h. Berlin Mean Time.

1900.	R.A.			Decl.
	h.	m.	s.	
May 21 ...	1	17	22 ...	+24 21' 8"
22 ...		16	27 ...	24 41' 4"
23 ...		15	30 ...	25 1' 2"
24 ...		14	31 ...	25 21' 4"
25 ...		13	29 ...	25 41' 8"
26 ...		12	26 ...	26 2' 6"
27 ...		11	21 ...	26 23' 6"
28 ...		10	13 ...	26 44' 9"
29 ...		9	3 ...	27 6' 5"
30 ...		7	50 ...	27 28' 4"
31 ...	1	6	34 ...	+27 50' 6"

At present the comet is moving slowly in a north-westerly direction through the constellation Pisces, almost in a line between  $\beta$  Arietes and  $\alpha$  Andromedæ.

COLOUR SCREENS FOR REFRACTING TELESCOPES.—The *Astronomische Nachrichten* (Bd. 152, No. 3636) contains a description of some experiments undertaken by Messrs. T. J. J. See and G. H. Peters, at the United States Naval Observatory, to determine the utility of viewing celestial objects through variously coloured screens. It was thought that if a suitable screen was chosen which would cut off the violet light of the secondary spectrum shown by the lens, that a considerable improvement of the definition might be expected, and after trial of several types of light filter, several were found which did materially improve the seeing. The screen specially recommended consists of a solution of picric acid and chloride of copper in alcohol. This is applied in a small cell made to fit as a cap outside the eyepiece of the telescope. It is thought that the method may improve meridian work by furnishing better defined star-discs, and also planetary micrometer measurements on account of the diminution of irradiation.

PHOTOMETRIC REVISION OF HARVARD PHOTOMETRY.—The Harvard Photometry, showing the brightnesses of stars north of declination  $-30^\circ$ , and of the sixth magnitude or brighter, was compiled from observations made during the period 1879-82. In 1891, on the return of the photometer to Cambridge from Peru, it was decided to redetermine the magnitudes of these stars, and by the end of 1894 the work was almost completed. Nearly all the observations were made by Prof. E. C. Pickering, the Director of the Observatory of Harvard College, and the results of the revision now form Part i. of the last issue of the *Annals of Harvard College Observatory*, vol. xlv.